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Cholinesterase sensors based on thick-film graphite electrodes for the flow-injection determination of organophosphorus pesticides

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Abstract

Flow cholinesterase sensors based on planar thick-film graphite electrodes and immobilized preparations of acetyl- and butyrylcholinesterase with various activities were developed. Analytical parameters of the determination of organophosphorus pesticides depend on hydrophilic-hydrophobic interactions at the membrane-solution interface. When passing from the steady-state to flow-injection conditions of signal measurements, the limits of detection of coumaphos and chlorpyrifos-methyl decrease by a factor of 5-8, while the limit of detection of hydrophilic trichlorfon increases by a factor of 3-4. The cholinesterase sensors developed in his work can measure the concentrations of pesticides in a continuous mode for 8-12 h with the throughput of up to 5-6 measurements per hour.

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